



Civil Engineering Plans Checklist

The following items must be submitted for the application to be considered complete.

****Labeling Your Submittals – Follow with All Documents Submitted**

- **Project Number – [First/Second/Third] Submittal [Document Title]**
 - Examples:
 - ZCP21-0001 – First Submittal Narrative
 - ZCP21-0001 – First Submittal ZCP Checklist
 - ZCP21-0001 – Second Submittal Landscape Plan
 - ZCP21-0001 – Second Submittal Façade Sheet B
- ****Your submittal will be deemed incomplete if your files are not properly labeled.**

Required for All Projects:

- 1.1 Project Narrative: Written proposal for the project including all proposed and existing utilities
- 1.2 Provide a copy of the City of Denton’s Owner Authorization Form, available online at www.cityofdenton.com/landdevelopment
- 1.3 All plan sheets shall be 24” x 36” with a plan view scale not smaller than 1” = 100’ with exception to the drainage area map which may be a scale not smaller than 1” = 400’
- 1.4 All plan sheets shall be sealed by the engineer of record including registration number
- 1.5 All documents are required to be PDF files; each sheet will be a single item and uploaded into ProjectDox.
- 1.6 Construction plans sets greater than one (1) sheet shall contain a cover sheet showing the name of the project, the engineer of record including address and phone number, the name of the developer or owner including address and phone number.
- 1.7 Provide Street Tree Plan, Landscape Plan, Tree Preservation Plan

Required for Transportation Related Improvements:

- 2.1 Label the area of the lot in square feet and acres including width and depth;

subdivision name, block, and lot; deed record

- 2.2 Provide overall paving plan sheet for the entire development as a separate CEP plan sheet. Paving plan sheet should identify all barrier-free ramps proposed for the development.
- 2.2 Plan and profile of all streets at 1" = 40 or larger horizontal and 1" = 4' vertical or larger scale. Each profile view shall line up directly under the corresponding plan view
- 2.3 Street curb return elevations shall be shown
- 2.4 Display elevation spacing on all profile views every 100 feet, every 25 feet along the vertical curve, changes in centerline slope, and the back of the curb on both sides of the street.
- 2.5 Display percent grades on all profile views
- 2.6 Label edge of pavement
- 2.7 Display connections to existing street network, including: barricade removal, pavement patching
- 2.8 Display horizontal and vertical curve data
- 2.9 Display all sidewalk ramps, flume entrances, and driveway approaches that will be constructed with public street improvements
- 2.10 Display all existing and proposed public sidewalks and bicycle path
- 2.11 Display all barrier free ramps, surface color, and texture treatment
- 2.12 Include all details for sidewalks, bike paths, ramps and pavement cross-sections
- 2.13 Display all existing and proposed guardrails and barricades
- 2.14 Include pavement marking and signage plans
- 2.15 Include temporary traffic control plans that are designed in accordance with the Texas Manual of Uniform Traffic Control Devices
- 2.16 Display street centerline at proposed street curvature points, with horizontal curve data.

Required for Utility Related Improvements:

- 3.1 Display casing and conduit for future utility crossings.
- 3.2 Display all existing utility and drainage features on plans views. Adjacent utilities and drainage crossings shall be shown for reference in the profile view
- 3.3 Display all manholes, junction boxes, valve boxes, inlets, and other surface features in plan view

- 3.4 Display all environmentally sensitive areas (ESA). If encroachment is proposed for the purposed for constructing roadways identified in the City's Mobility Plan a separate plan shall be provided to restore the ESA and minimize erosion and promote the recovery of the ESA

Required for Sanitary Sewer:

- 4.1 Include an overall plan view of the sanitary sewer system layout for the entire development
- 4.2 Display sanitary sewers in all plan and profile views including stationing (1" = 40' or larger horizontal and 1" = 4' or larger vertical scales)
- 4.3 Specify size and type of pipe material in profile views
- 4.4 Display all flow line invert elevations in the profile view every 100 feet including: all manhole entrances, exits, and connections to existing systems
- 4.5 Display all proposed ground elevations over sanitary sewer
- 4.5 Display the stationing of all proposed manholes, clean outs and service lines
- 4.6 Display all existing and proposed utilities and storm drains that will cross the sanitary sewer
- 4.7 Display the location of lot lines, easement lines, Rights of Way (ROW) limits, proposed and existing water main, storm sewers, and other utility lines in the plan view
- 4.8 Display the location of any environmentally sensitive areas (ESAs), proposed encroachments, method of pipe installation (boring or open trench). If boring is proposed, provide profile views indicating enter and exit points, and distance between bottom of channel and upper limit of pipe casing
- 4.9 **Check box if this development proposes a lift station
- 4.10 All sheets that relate to the design and construction of a lift station must be differentiated from other sheet types with a lift-station-specific sheet number designation (Ex: LS-1, LS-2, etc.)

Required for Water Mains:

- 5.1 Include an overall plan view of the water system layout for the entire development.
- 5.2 Display water mains in all plan and profile views including stationing
- 5.3 Display the location of lot lines, easement lines, Rights of Way (ROW) limits, proposed and existing sanitary sewer, storm sewers, and other utility lines in the plan view

- 5.4 Label location stationing of all valves, bends, crosses, tees, fire hydrants, reducers, and other fittings and appurtenances in the plan and profile view
- 5.5 Display stationing of all proposed water mains 12 inches in diameter or larger in the plan profile view (1" = 40' or larger horizontal and 1" = 4' or larger vertical scales)
- 5.6 When profile views are required, show flow line invert elevations of proposed water mains on 100 foot intervals, bends, and connections to existing water mains
- 5.7 Specify size and materials in plan and profile views
- 5.8 Display the location of any environmentally sensitive area (ESAs, proposed encroachments, method of pipe installation (boring or open trench). If boring is proposed, provide profile views indicating enter and exit points, and distance between bottom of channel and upper limit of pipe casing

Required for Drainage Area Map:

- 6.1 Use 1" = 100' scale for on-site, and 1" = 200' for off-site. Scale may be reduced to 1" = 200' onsite and 1" = 400' for larger watersheds
- 6.2 Display existing and proposed storm drains and inlets with different line type designations. Describe in legend or label existing improvements
- 6.3 Label sub-areas for alley, street, and off-site areas. Display flow arrows within each sub-area
- 6.4 Label design points of flow concentration for cumulative areas on Drainage Plan and list the design point on the Drainage Calculations Table
- 6.5 Include approved zoning designation or future land use designation for each area shown
- 6.6 Include peak runoff rate at all inlets, dead-end streets, and alleys. Include adjacent acreage flows crossing the property. Map
- 6.6 Label peak discharges accumulated in the storm sewer system at each analysis point
- 6.7 Include runoff calculations for all areas showing acreage, runoff coefficient, and inlet time. (Q = CIA Table or FORM A). List the "C Value Adjustment factors used in the calculations
- 6.8 Label all crests, sags, street, and alley intersections with flow arrows

- 6.9 Provide open channel calculation table and formula used, provide Manning's "N" values
- 6.10 Label limits of 100-year fully developed flood plain and floodway. List Flood Insurance Rate Map (FIRM) panel reference number and date, and/or Letter of Map Revision (LOMR) Case Number and effective date
- 6.11 Label the 100-year flood elevations from FIRM
- 6.12 Include how the flood plain limits were transferred from FIRM panel, (i.e. either by scaling distances or by interpretation of elevations onto the site topography)
- 6.13 Provide inlet capacity formulas and inlet design computation table

Required for Storm Sewers:

- 7.1 Display stationing plan and profile of all storm sewers (1" = 40' or larger horizontal and 1" = 4' or larger vertical scales)
- 7.2 Specify diameter, size, slope, and type of material for all pipes
- 7.5 Include culvert design calculations and tail water condition
- 7.6 Include a detail for all headwalls and flumes at storm sewer outfalls
- 7.7 List the riprap rock size, specifications, and underlying blanket thickness. Including riprap: hydraulic data, sizing calculations, and dimensions
- 7.8 Provide calculations and construction details for energy dissipaters
- 7.9 Provide compaction, testing specifications, and frequency where fill is proposed for open cut trenches in creeks or outfall ditches
- 7.10 Display easements for downstream properties
- 7.11 Display ESA limits at all pipe outfalls

Required for Storm Sewer Plan and Profile:

- 8.1 Display property lines, lot lines, and easements with dimensions along storm sewers
- 8.2 Provide separate plan and profile of storm sewers
- 8.3 Label pipe sizes, curb inlets, manholes, junction boxes, etc. in plan and profile

- 8.4 List hydraulics on each segment of pipe profile to include: Q_{100} , $C = \text{Manning}$ full flow capacity; S , V , $V^2/2g$. Plot and label HGL elevations and friction slope whenever full flow in the pipe system is anticipated
- 8.5 Display curve data for all storm sewer system
- 8.6 Show all existing utilities in plan view
- 8.7 Display sanitary sewer profiles for lines 12 inches in diameter or greater
- 8.8 Display existing and proposed ground line on all street, alley, and storm sewer profiles
- 8.9 Show future streets, grades, drainage system layout, and connection points
- 8.10 Display flow line invert elevations of storm sewers on profile view at 100-foot stations, pipe slope (percent grade), manhole and junction box connections
- 8.11 Display dimensioned details of all non-standard junction boxes, headwalls, storm sewers, flumes, and manholes
- 8.12 Label water surface elevation at storm drain outfall in profile
- 8.13 Display “daylight” drainage outfall flowline points of connection to existing grade
- 8.14 Display minimum finished floor elevations at sags in pavement
- 8.15 Provide cross sections for design water surface, road, railroad, and ditches with profiles and hydraulic computations

Required for Laterals, Inlets at Intakes:

- 9.1 Display laterals on trunk profile with stations
- 9.2 Include lateral profiles if longer than 25 feet and when crossing utilities
- 9.3 Include the hydraulic grade line and calculations for laterals and inlets on profile
- 9.4 Display runoff and direction of flow concentrating at all inlets and direction of flow
- 9.5 Show runoff for all stub outs, pipes and intakes
- 9.6 Display size of inlet, lateral size, top-of-curb elevations, station, and inlet designation number

Required for Detention or Retention Pond:

- 10.1 Include drainage area map and show all computations for runoff affecting the detention basin
- 10.2 Display existing and proposed contours for the detention basin and for structural measures
- 10.3 Include embankment section for water storage impoundment and compaction specifications with profile of the controlling outflow structure
- 10.4 Include structural details and calculations for detention items
- 10.5 Include detention basin volume calculations including water quality volume (WAQAv) per Integrated Stormwater Management (iSWM) methodologies
- 10.6 Include detention elevation versus storage curve
- 10.7 Include hydraulic calculations for outflow structure
- 10.8 Include elevation versus discharge curve for outflow structure
- 10.9 Include routings or modified rational determination of storage requirements, demonstrating that critical duration is used (permitted for areas of 1000 acres or less)
- 10.10 Provide the Detention Pond Design Computation Sheet 10-1 from section 3.6 in the Stormwater Design Criteria Manual for all proposed detention and retention ponds
- 10.11 Display fencing if proposed around detention area

Required for Bridge:

- 11.1 Display geotechnical soil boring information on plans
- 11.2 Display upstream and downstream stream channel sections
- 11.3 Display hydraulic calculations on all channel sections
- 11.4 Display structural details and calculations with dead load deflection diagram
- 11.5 Display skew angle, vertical and horizontal centerline alignment
- 11.7 Include bridge scour analysis
- 11.8 Display the location of all environmentally sensitive areas (ESAs)
- 11.9 Include vertical bench mark description

Required for Grading Plan:

- 12.1 Include grading plan that shows proposed contours and spot elevations that address lot to lot drainage. Delineate the proposed limits of land disturbing activities
- 12.2 Include cross section of typical swale, berm, channel, etc. as a component of grading plan
- 12.3 Where reclamation of the 100-year floodplain is involved, provide a note on grading plan that states: Upon completion of public improvements, submission of all documents necessary to obtain a Letter of Map Revision (LOMR) from FEMA shall be submitted to the City of Denton. The LOMR will then be reviewed and sent to FEMA prior to acceptance of the subdivision. The LOMR is necessary to remove any lot within the floodplain from the Flood Insurance Rate Map. All changes or additional data, as requested by FEMA upon its review of the LOMR, are the responsibility of the owner and/or developer

Required for Channels:

- 13.1 Include typical section for channel improvements with additional typical section where the channel changes its dimensions or configuration
- 13.2 Include plan and profile showing existing contours and proposed centerline, top-of-bank, flow line elevations, stationing and 100-year water surface elevation
- 13.3 Include hydraulic calculations for all channel sections
- 13.4 Provide structural details for channel typical sections that display lining treatment such as: seeding, sodding, concrete, gabions, paving material, etc.

Required for Erosion Control Plan:

- 14.1 Display the limits of clearing, grubbing and land disturbing areas.
- 14.2 Display the limits of existing critically area boundaries and related setbacks, such as Environmentally Sensitive Areas, floodplains and waterways, septic tanks and drainfields, other underground tanks, water wells and corresponding wellhead protection areas
- 14.3 Display locations and details of temporary erosion / sediment control devices and best management practices (BMPs) for all phases of development
- 14.4 Display natural drainage features for both existing and proposed conditions
- 14.5 Display locations of construction exit(s), stockpiles and concrete washout
- 14.6 Display permanent stabilization detail
- 14.7 Display location and details of temporary sediment basin(s), required if disturbed drainage area is 10 acres or greater. Provide sediment basin drainage calculations, de-watering times, basin dimensions, and an outlet/dewatering structure compliant

with iSWM Technical Manual Standards

- 14.8 Include General erosion control notes per the Stormwater Design Criteria Manual
- 14.9 Include iSWM Construction Controls per the Stormwater Design Criteria Manual

Additional Submittal If Applicable:

15.1 ALTERNATIVE MATERIAL REQUESTS:

All construction materials to be used on public improvements shall be compliant with the approved materials list. Alternative material requests may be submitted for consideration prior to issuance of the Notice to Proceed. All alternative material requests shall be reviewed and sealed by the engineer-of-record prior to submittal. Please refer to the Alternative Materials Request Form available online at www.cityofdenton.com/landdevelopment for additional details.